GEORGIA INSTITUTE OF TECHNOLOGY — OFFICE OF CONTRACT ADMINISTRATION

PROJECT ADMINISTRATION DATA SHEET

[x] ORIGINAL [ ] REVISION NO. _____

Project No. D-48-644 GTRI/~~GIT~~ DATE 6 / 13 / 84

Project Director: Anthony J. Bradshaw School/~~Lab~~ Architecture

Sponsor: State of Georgia; Department of Human Resources; Division of Rehabilitation Services

Type Agreement: Contract No. 427-93-40667

Award Period: From 2/15/84 To ~~6/15/84~~ 4-15-85 (Performance) 7/10/84 (Reports)

Sponsor Amount:	This Change	Total to Date
Estimated: $		$ 24,750
Funded: $		$ 24,750

Cost Sharing Amount: $ n/a Cost Sharing No: _____

Title: "Development of an Electronic Workstation for the Mobility Impaired"

ADMINISTRATIVE DATA OCA Contact Lynn Boyd x4820

1) Sponsor Technical Contact:

Ms. Sandra C. Guthrie
Departmental Contract Coordinator
Office of Financial Services
Department of Human Resources
47 Trinity Avenue
Atlanta, GA 30334

2) Sponsor Admin/Contractual Matters:

Mr. Joe Patrick
Division of Vocational Services
State of Georgia; Department of Human Resources; 47 Trinity Avenue
Atlanta, GA 30334 (404) 656-2480

Defense Priority Rating: n/a Military Security Classification: n/a

(or) Company/Industrial Proprietary: n/a

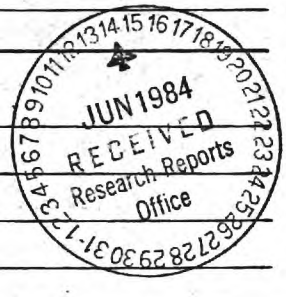
RESTRICTIONS

See Attached _____ Supplemental Information Sheet for Additional Requirements.

Travel: Foreign travel must have prior approval — Contact OCA in each case. Domestic travel requires sponsor approval where total will exceed greater of $500 or 125% of approved proposal budget category.

Equipment: Title vests with State of Georgia, DVR; Paragraph 203 of Contract; monthly equipment purchases report is required.

COMMENTS:



Sponsor I.D. #02.300.000.84.002

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FORM OCA 4:383

GEORGIA INSTITUTE OF TECHNOLOGY OFFICE OF CONTRACT ADMINISTRATION

SR-687

SPONSORED PROJECT TERMINATION/CLOSEOUT SHEET

Date 4/1/86

Project No. D-48-644 School/~~Unit~~ Arch.

Includes Subproject No.(s) N/A

Project Director(s) Tony Bradshaw GTRC / ~~GIT~~

Sponsor State of Georgia; Department of Human Resources: Division of Rehabilitation

Title "Development of an Electronic Workstation for the Mobility Impaired"

Effective Completion Date: 4/15/85 (Performance) 5/10/85 (Reports)

Grant/Contract Closeout Actions Remaining:

- [X] None
- [ ] Final Invoice or Final Fiscal Report
- [ ] Closing Documents
- [ ] Final Report of Inventions
- [ ] Govt. Property Inventory & Related Certificate
- [ ] Classified Material Certificate
- [ ] Other _____

Continues Project No. _____ Continued by Project No. _____

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Form OCA 60:1028

D-48-644

Center for Rehabilitation Technology

College of Architecture
Georgia Institute of Technology
Atlanta, Georgia 30332

(404) 894-4960

ELECTRONIC WORKSTATION FOR THE MOBILITY IMPAIRED

Final Report

DHR Contract #427-93-40667

Georgia Tech Contract #D48-644

ABSTRACT: An electronic workstation, designed to mitigate certain disabling, kinesic restrictions of mobility impaired individuals in the workplace, has been developed by the Center for Rehabilitation Technology at Georgia Institute of Technology, for the State of Georgia Department of Human Resources. The workstation incorporates five function modules: computer station, printer station, electronic filing system, elevated reference retrieval system, and electronic turntable/work surface. The modular components are mounted on a standard, office wall-panel system and are spatially arranged to increase the effectiveness of the mobility impaired user in the workplace by providing easy access to working materials.

INTRODUCTION: According to recent U.S. census reports, 8.5% of the total U.S. population currently in the work force is considered disabled. Of that number, over 5 million people have disabilities related to reaching and handling, and over 10 million people have disabilities related to lifting. Because motor skills such as reaching, handling and lifting are often required of working individuals, the mobility impaired often face major difficulties functioning efficiently on the job. People disabled by spinal cord injuries or by numerous other causes of restricted mobility have a common vocational need for workstations that are adjustable and adaptable to their specific job requirements and specific disabilities. The mobility impaired individual, regardless of education and training, must have an appropriate workstation to maximize the functional use of his or her remaining range of motion. By maximizing his restricted motor range with automated equipment, an adaptable, electronic workstation can increase the employment opportunities of the mobility impaired.

Consequently, the Center for Rehabilitation Technology at the Georgia Institute of Technology in conjunction with the Georgia Department of Rehabilitation Services has developed a modular workstation system that will allow mobility impaired persons to

work in a normal office environment. This workstation is the second prototype in a series of electronically controlled workstations being developed by the Center for Rehabilitation Technology.

GOAL: The goal of this project was to develop and organize an office workstation that would help to remediate poor vocational performance caused by the manual limitations of mobility impaired individuals. This required 1) identifying the specific motor skills required of a particular client by a particular job, 2) determining the extent of the client's ability to perform those skills, 3) designing office equipment components which would maximize the remaining range of the client's motion, and 4) developing a workstation that would house the required equipment and still fit easily into a standard office environment.

PRODUCT DESCRIPTION: The adaptable workstation developed in this project is composed of five function modules: 1) a powered carousel file, 2) a powered turntable, 3) a powered reference book storage rack, 4) a computer station, and 5) a printing station. The modules are mounted on standard Herman Miller wall system panels and can be adjusted vertically and horizontally into an arrangement which accommodates the specific range of motion of the mobility impaired user. The workstation 1) helps the user to bring files and reference materials adjacent to the central turntable where he is positioned, 2) allows quick retrieval and storage of work materials and 3) promotes efficient use of the workspace.

Powered File Carousel

The filing system module is housed in a revolving carousel which is 26" in diameter and divided into thirty wedge-shaped, vertical slots. Each slot corresponds to a letter of the alphabet, and four additional slots are available for often-used files. The user operates the system by inputing file requests into a pushbutton computer keypad which instructs the carousel to turn until the requested file slot is located and moved into the position closest to the user. This procedure minimizes the extent of reach required to retrieve and store files.

Powered Reference Module

The reference module is a computer-controlled book elevation and storage system which raises reference books to a position level with an adjacent work surface; this system eliminates the need

for gross motor movements such as bending, reaching and lifting often required to move heavy books or materials. The book storage elevator measures 20" x 15" x 27 1/2" and is divided into seven horizontal storage shelves. The adjacent work surface measures 24" x 24". The user operates the system by inputing reference level/shelf requests into the computer keypad which instructs the elevator to lift or lower until the required shelf is located and moved into a position level with the surface of the adjacent workstation desk. The user then slides the material from the shelf onto the desk surface for reference use.

Central Work Station

The central work station is a general purpose work surface. A major portion of this surface is made up of a powered turntable which rotates to one of four positions at ninety degree intervals, minimizing the user's need to reach for items located on the working surface. Integrated into the turntable at one position is an adjustable 10 1/2" x 11 3/4" writing surface/book prop with variable tilt capacity: eight tilt-positions create angles with the work surface ranging from 20 degrees to 60 degrees, in 5 degree increments.

Computer Module

The computer module provides enough space to accommodate any desktop computer, monitor, and keyboard. To optimize user comfort, the keyboard platform is adjustable: 1) it can be moved forward or back, and 2) the angle of inclination can be adjusted.

Printing Module

This unit is mounted on arm brackets with torque knobs, allowing the printer to be adjusted to any degree about the torque knob axis. The printer housing, which will be offered in three module sizes to accommodate any desktop printer, is covered with a plexi-glass lid and is lined with built-in acoustical sound dampening. Printer paper is stored on a shelf below the printer and feeds in through the top of the unit.

Control Panel

The prototype described here utilizes a Cutler-Hammer Programmable Controller (Model MPC 1). The control panel, located under the file carousel, is housed in a sound dampening

cover. Standard wiring and connections link module proximity sensors with the control panel input ports and module relays with the control panel output ports.

The workstation user interfaces with the controller by means of a membrane keyboard that consists of function and numeric commands. The 6" x 10" x 1.5" keypad can be mounted at the most convenient access location on an individual's preference. The keypad is easily activated by mouthstick, pushstick, or finger.

For retrieving a file, for example, the user would depress function key, then #2, to activate the file carousel, then #1, enter, to rotate the carousel to the "A" file. (The central turntable is function #1; the storage rack is function #3.) The "A" file slot would rotate to face the user.

Further Development

Under other DRS/Georgia Tech core staff contracts, CRT is examining additional technologies and production possibilities.

Currently, the feasibility of voice activation for module control is being studied. Also, robotic arm modules are in the planning stages for incorporation into the workstation system. The purpose for voice activation and robotic assistance is to meet the needs of high level quadriplegics who have no use of their arms and hands.

Production of the workstation modules is within the capacities of sheltered workshop facilities. Workstation modules are primarily constructed of plywood and plastic laminate. These components could be designed in such a way to be produced in a sheltered facility. These components could then be forwarded to another facility for assembly. The mechanisms, sensors, and electronics could then be added at a distribution center, such as Warm Springs.

Testing

The second generation workstation is currently located at the CRT Development Lab on the Georgia Tech campus. RWSIR has indicated a desire for testing and evaluation. The unit is scheduled for shipment in mid-summer 1986.

Any questions concerning the electronic workstation should be directed to Anthony J. Bradshaw, Center for Rehabilitation

Technology, College of Architecture, Georgia Tech, Atlanta, GA 30332-0156, phone (404) 894-4960 GIST 222-4960.

AJB:ac

Attachments